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D. Remarks

Objections to Claims.

Claim 12 has been amended to address the claim objections. The claim has been  
5 amended as interpreted by the Examiner.

Rejection of Claims 1-5, 7, 8 and 16 Under 35 U.S.C. §102(b) based on U.S. Patent No. 5,93,192  
(*Kubly et al.*).

The rejection of claims 1-5 and 7-8 will first be addressed.

10 The invention of Applicants' claim 1 is directed to a method that includes bending a substrate by applying a force with a movable chuck portion to orient essentially all of a surface of the substrate at a predetermined angle with respect to an input source.

15 As is well known, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference. Because the cited reference does not show various limitations of claim 1, this ground of rejection is traversed.

The reference *Kubly et al.* discloses methods and apparatuses for clamping and declamping a wafer in a system. Such methods utilize an electrostatic chuck, however, the arrangements shown in the reference never show or suggest a bending of a substrate, or a movable chuck portion.

20 *Kubly et al.* does not show the bending of a substrate. In *Kubly et al.* electrostatic force is used to clamp a wafer (argued to correspond to Applicants' substrate) to an electrostatic chuck:

[T]hese electrostatic potential differences exert electrostatic forces on the wafer to clamp it to the electrostatic chuck.<sup>1</sup>

25 However, in all such cases the chuck to which a wafer is clamped is flat. Consequently, the wafer remains flat and thus there is no bending. This is reflected by the appropriate figures of *Kubly et al.*:

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<sup>1</sup> *Kubly et al.*, Col. 3, Lines 31-33.

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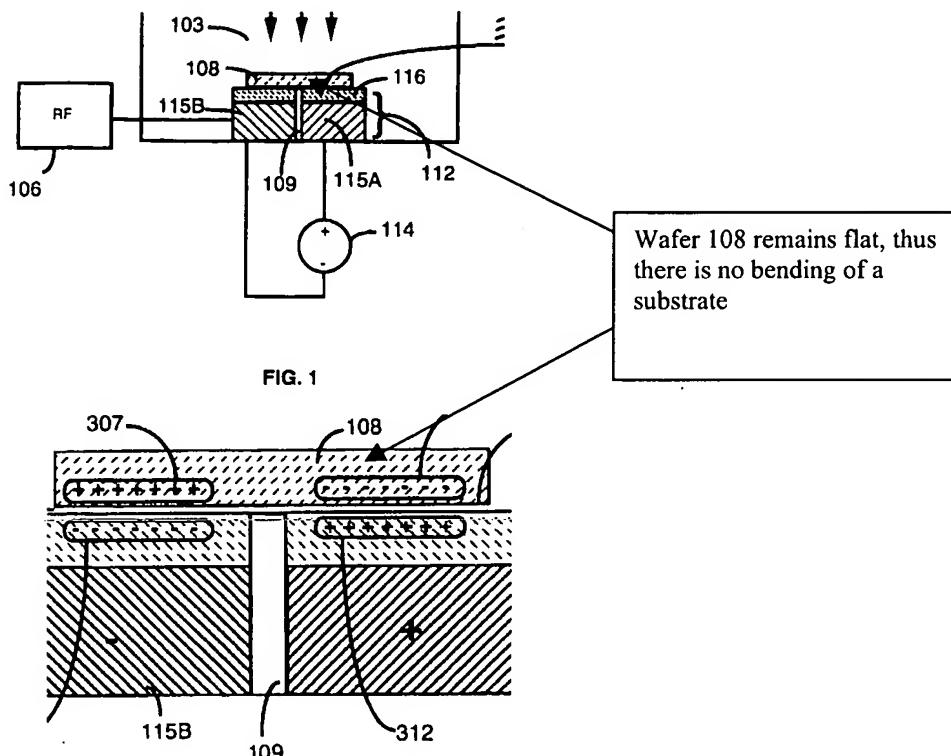


FIG. 3

5 Applicants additionally note that all references to the term "wafer" in *Kubly et al.* never describe any warping, deformation, or other type of bending. If it is believed that Applicants reading of the reference is in error, a citation is respectfully requested to indicate where in the reference the bending of the wafer is shown or suggested.

10 *Kubly et al.* does not show or suggest a movable chuck portion, either. *Kubly et al.* shows examples of electrostatic chucks, however such chucks are never described as having any movable portion. In particular, a chuck 112 is described with reference to FIG. 1, however, the chuck does not have any movable parts<sup>2</sup>. Similarly, the same chuck is shown in detail in FIG. 3. Again, the chuck 112 has no movable parts<sup>3</sup>.

Accordingly, because the reference never shows or suggests a chuck with a movable

<sup>2</sup> See *Kubly et al.*, Col. 1, Line 34 to Col. 2, Line 2, where chuck 112 (erroneously referred to as 102, as well) is never shown to have a movable part.

<sup>3</sup> See *Kubly et al.*, Col. 3, Lines 15-58, which never indicates chuck 112 has a movable part.

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portion, the rejection is traversed for this additional reason.

If it is believed that this reading of the reference is in error, Applicants respectfully requested a citation to indicate where the application of a “force with a movable chuck portion” is shown or suggested.

5 Various claims depending from claim 1 include additional limitations not shown or suggested by the cited reference.

Applicants’ claim 2 recites that the substrate comprises a silicon wafer having a diameter of at least about eight inches. Such a limitation is not shown in the cited reference. While *Kubly et al.* describes the clamping of a wafer to an electrostatic chuck, the reference never shows or 10 suggests any particular wafer size, let alone Applicants’ particular limitation of at least eight inches.

Applicants’ claim 5 recites that the bending a substrate includes receiving the substrate in a recess having a concave shape. No grounds for rejection have been provided for this claim<sup>4</sup>. Accordingly, the burden of examination cannot have been met for this claim. In addition, as 15 noted above, all example of electrostatic chucks in *Kubly et al.* are flat, thus cannot have a concave shape.

For all of these reasons, this ground for rejection is traversed.

The rejection of claim 16 will now be addressed.

20 The invention of claim 16 is directed to a system. The system includes an input source for processing a substrate. In addition, the system includes a chuck system having a substrate receiving surface that receives the substrate in an essentially non-deformed shape, and a force applying portion. The force applying portion applies an attractive force between the substrate and the chuck system that maintains the substrate in a deformed shape

25 To address this ground for rejection, Applicants incorporate by reference herein the same general comments set forth above for claim 1. In particular, while *Kubly et al.* teaches an electrostatic chuck, all examples of this reference show a wafer that remains unchanged in shape. Thus, the reference does not show or suggest a substrate maintained in a deformed shape.

Accordingly, because the cited reference does not show all limitations of claim 16, this

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<sup>4</sup> See the Office Action, dated 10/10/03, Pages 3-4. While claim 5 is listed as a rejected claim, no grounds for rejecting the claim are provided.

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ground for rejection is traversed.

Rejection of Claims 6, 9-15 and 17-20 Under 35 U.S.C. §103(a), based on *Kubly et al.* in view of U.S. Patent No. 5,218,209 (*Takeyama*).

5 The rejection of claims 6 and 9 will first be addressed.

Claim 6, which depends from claim 5, recites that bending the substrate includes introducing a curvature into the substrate selected from the group consisting of spherical, conical and cylindrical.

As is well known, in proceedings before the Patent and Trademark Office, the examiner 10 bears the burden of establishing a prima facie case of obviousness based on the prior art. Further, to establish a prima facie case of obviousness, a rejection must meet three basic criteria. First, there must be some suggestion or motivation to modify a reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference(s) must teach or suggest all claim limitations.

15 To the extent that this rejection relies on the reference *Kubly et al.*, Applicants incorporate by reference herein the comments set forth above for claim 1. Namely, that this reference cannot show applying a force with a “movable chuck portion”.

The second reference relied upon for this rejection, *Takeyama*, does not show or suggest a 20 movable chuck portion, either. *Takeyama* is directed to an ion implanter. *Takeyama* shows a conically curved wafer holding surface. However, *Takeyama* does not show a chuck, let alone a movable chuck portion<sup>5</sup>, as recited in claim 1.

Thus, because the cited combination of references does not show or suggest all limitations of independent claim 1, the rejection of claim 6 (which depends from claim 1) is traversed.

25 In addition or alternatively, there is no motivation for combining the references as proposed by the rejection.

It is well established if a proposed modification or combination would change the principle operation of the prior art invention being modified, the teachings of the references are

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<sup>5</sup> See *Takeyama et al.*, all figures, which only show a wafer holding surface 1, which does not include any movable chuck portion.

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not sufficient to render the claims *prima facie* obvious.<sup>6</sup>

The modification proposed by the rejection would change the principle operation of the reference *Kubly et al.* The rejection proposes the following:

5 It would have been obvious... to modify the device of *Kubly et al.* by providing a curvature of the substrate... in order to prevent the implanted ions from deviating from the perpendicular in view of the teachings of *Takeyama*.<sup>7</sup>

10 *Kubly et al.* teaches an arrangement in which a chuck is placed in a plasma processing chamber along with numerous other system components:

15 [P]lasma processing system 100 typically includes a plasma processing chamber 102, a first radio frequency (RF) power supply 104, and a second RF power supply 106. Within plasma processing chamber 102, there may be disposed a shower head 110 and an electrostatic chuck 112<sup>8</sup>.

As set forth in FIG. 1 of *Kubly et al.*, these components are connected to one another, with RF power supply 104 coupled to shower head 110 and RF power supply 106 connected to chuck 112.

20 *Takeyama* rotates an entire wafer holding surface in order to curve a wafer surface<sup>9</sup>. Thus, in order to make the modification proposed by the rejection, the entire system of *Kubly et al.* would have to be rotated. This would change the principle operation of *Kubly et al.* from a stationary system to one that rotates. Further, it is not understood how RF power could be provided to a shower head and/or chuck in such a rotating system without changing the principle 25 operation of the system.

Thus, because the cited reference does not show all limitations of claim 6, and the necessary suggestion/motivation for combining the references is believed to be lacking, a *prima facie* case of obviousness has not been established for this claim, and this ground for rejection is

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<sup>6</sup> *In re Ratti*, 123 USPQ 349 (CCPA 1959).

<sup>7</sup> See the Office Action, dated 10/10/02, Page 4, Lines 15-18.

<sup>8</sup> *Kubly et al.*, Col. 1, Lines 29-35.

<sup>9</sup> See *Takeyama*, Col. 3, Lines 5-8.

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traversed.

The rejection of claims 10-15 will now be addressed.

The invention of claim 10 is directed to a method of processing an integrated circuit wafer. The method includes placing a wafer over a concave chuck portion; applying a force to the wafer to conform to the concave chuck portion; and maintaining the wafer in the deformed shape as the wafer is processed with respect to an input source.

To address this ground for rejection, Applicants incorporate by reference herein the same general comments set forth above for claim 6. Namely, that modifying *Kubly et al.* in view of *Takeyama* would change the principle operation of the prior art invention being modified. Accordingly, motivation for such a modification is believed to be lacking, and a *prima facie* case of obviousness has not been established.

Claims 13-15 include additional limitations not shown or suggested by the cited reference.

Claim 13 includes applying a force “with a movable chuck portion”. Claims 14 and 15 set forth different ways of applying such a force. As noted above in the comments above, *Kubly et al.* never shows or suggests a movable chuck portion. Likewise, a movable chuck portion is not shown or suggested by *Takeyama*, either. Accordingly, all limitations for these claims are not shown or suggested, and a *prima facie* case of obviousness has not been established.

20 The rejection of claims 17-20 will now be addressed.

To address this ground for rejection, Applicants incorporate the same general comments set forth above for claim 6. Namely, that modifying *Kubly et al.* in view of *Takeyama* would change the principle operation of the prior art invention being modified. Accordingly, motivation for such a modification is believed to be lacking, and a *prima facie* case of obviousness has not been established.

With respect to claims 19 and 20, Applicants additionally note that these claims recite a force applying portion of a chuck system that includes a “movable portion”. As noted in the comments for claim 6, neither *Kubly et al.* nor *Takeyama* shows or suggests such a limitation. Accordingly, a *prima facie* case of obviousness cannot have been established for these claims.

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Claim 12 has been amended, not in response to the cited art, but to correct a typographical error. New claim 21 has been added. Claim 21 depends from claim 1.

The present claims 1-21 are believed to be in allowable form. It is respectfully requested  
5 that the application be forwarded for allowance and issue.

Respectfully Submitted,

 12/9/13

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